

**CLAIMS**

What is claimed is:

- 5     1. An antigen detection device for detecting the presence of an antigen in a fluid sample, the antigen detection device comprising:
  - a substrate micro-fabricated to define an antigen detection well;
  - an antibody disposed in the antigen detection well, the antibody being specific for the antigen being tested; and
- 10    an electrode positioned adjacent the antigen detection well for detecting whether the antibody is binding to an antigen.

2. The antigen detection device of claim 1 wherein the electrode is micro-fabricated as part of the substrate.
3. The antigen detection device of claim 1 wherein a plurality of the antigen detection wells  
5 are provided on the substrate.
4. The antigen detection device of claim 1 wherein the antigen detection well includes an antibody containment basin.
- 10 5. The antigen detection device of claim 1 further comprising an electronic reader apparatus adapted for making an electronic connection with the electrode, the electronic reader apparatus having a computer programmed to determine whether the antigen is binding with the antibody.

6. An antigen detection device for detecting the presence of an antigen in a fluid sample, the antigen detection device comprising:

a substrate micro-fabricated to define a mesoscale flow system that includes:

an input well;

5 an outlet well;

a plurality of antigen detection wells;

a plurality of input flow channels in fluid communication with the input well and each of the plurality of antigen detection wells; and

a plurality of outlet flow channels in fluid communication with outlet well and each of the plurality of antigen detection wells;

10 at least one test reagent containing an antibody that is specific for the antigen being tested; and

a means for detecting whether the antibody is binding to an antigen in at least one of the plurality of antigen detection wells.

7. The antigen detection device of claim 6 wherein each of the at least one test reagents is disposed within one of the plurality of antigen detection wells.

8. The antigen detection device of claim 6 wherein the means for detecting is an electrode  
5 positioned adjacent the antigen detection well for detecting whether the antibody is binding to an antigen.

9. The antigen detection device of claim 6 wherein each of the plurality of antigen detection  
10 wells includes an antibody containment basin.

10. The antigen detection device of claim 6 further comprising an electronic reader apparatus  
adapted for making an electronic connection with the electrode, the electronic reader apparatus having a computer programmed to determine whether the antigen is binding  
15 with the antibody.

11. A method for detecting the presence of an antigen in a fluid sample, the method comprising the steps of:

providing a substrate micro-fabricated to define an antigen detection well with an electrode positioned adjacent to the antigen detection well;

5 binding an antibody specific to the antigen to the antigen detection well;

adding the fluid sample to the antigen detection well;

measuring the electrical conductivity at the electrode; and

determining whether the antibody is binding to an antigen in the antigen detection well based upon the measured conductivity.